

1 **CLAIMS**

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3 1. One or more processor-accessible media comprising processor-
4 executable instructions that, when executed, direct a device to perform actions
5 comprising:

6 receiving from an entity a bandwidth allocation request stipulating a
7 requested bandwidth amount for a stream of the entity for a current superframe;

8 ascertaining an unserviced bandwidth amount of the stream of the entity
9 from a previous superframe; and

10 determining an allocated bandwidth amount for the stream of the entity
11 based on the unserviced bandwidth amount and responsive to the bandwidth
12 allocation request.

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14 2. The one or more processor-accessible media as recited in claim 1,
15 comprising the processor-executable instructions that, when executed, direct the
16 device to perform a further action comprising:

17 transmitting an allocation broadcast that includes the allocated bandwidth
18 amount to the entity.

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1 3. The one or more processor-accessible media as recited in claim 1,
2 comprising the processor-executable instructions that, when executed, direct the
3 device to perform a further action comprising:

4 segmenting the requested bandwidth amount into a newly-arrived
5 bandwidth amount of the stream of the entity and the unserved bandwidth
6 amount.

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8 4. The one or more processor-accessible media as recited in claim 3,
9 comprising the processor-executable instructions that, when executed, direct the
10 device to perform a further action comprising:

11 updating a reserved bandwidth amount of the stream of the entity for the
12 current superframe using the newly-arrived bandwidth amount, a previous
13 reserved bandwidth amount of the stream of the entity from the previous
14 superframe, and a smoothing factor.

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16 5. The one or more processor-accessible media as recited in claim 1,
17 wherein the action of receiving comprises an action of:

18 receiving the bandwidth allocation request via a wireless
19 communication.

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21 6. The one or more processor-accessible media as recited in claim 1,
22 wherein the action of ascertaining comprises an action of:

23 retrieving from memory the unserved bandwidth amount.

1 7. The one or more processor-accessible media as recited in claim 1,
2 wherein the one or more processor-accessible media comprise at least one of (i)
3 one or more storage media and (ii) one or more transmission media.

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5 8. The one or more processor-accessible media as recited in claim 1,
6 wherein the action of determining comprises an action of:

7 assigning at least one bandwidth unit to the unserved bandwidth
8 amount.

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10 9. The one or more processor-accessible media as recited in claim 8,
11 wherein the at least one bandwidth unit comprises at least one time unit.

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13 10. The one or more processor-accessible media as recited in claim 8,
14 wherein the action of determining further comprises an action of:

15 assigning at least one bandwidth unit to a reserved bandwidth
16 amount of the stream of the entity.

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18 11. The one or more processor-accessible media as recited in claim 10,
19 wherein the action of determining further comprises an action of:

20 assigning at least one bandwidth unit to an overloaded bandwidth
21 amount of the stream of the entity after the assigning of the at least one
22 bandwidth unit to the unserved bandwidth amount and to the reserved
23 bandwidth amount.

1 **12.** The one or more processor-accessible media as recited in claim 11,
2 comprising the processor-executable instructions that, when executed, direct the
3 device to perform a further action comprising:

4 combining the at least one bandwidth unit assigned to the unserved
5 bandwidth amount, the at least one bandwidth unit assigned to the reserved
6 bandwidth amount, and the at least one bandwidth unit assigned to the overloaded
7 bandwidth amount into an allocated bandwidth amount comprising a time slot to
8 be allocated to the stream of the entity for the current superframe.

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10 **13.** The one or more processor-accessible media as recited in claim 10,
11 comprising the processor-executable instructions that, when executed, direct the
12 device to perform a further action comprising:

13 detecting if an available bandwidth resource for the current superframe has
14 been exhausted after the action of assigning at least one bandwidth unit to the
15 reserved bandwidth amount of the stream of the entity;

16 if not, assigning at least one bandwidth unit to an overloaded
17 bandwidth amount of the stream of the entity.

1 **14.** A device comprising:

2 at least one processor; and

3 one or more media including processor-executable instructions that are
4 capable of being executed by the at least one processor, the processor-executable
5 instructions adapted to direct the device to perform actions comprising:

6 receiving from an entity a bandwidth allocation request stipulating a
7 requested bandwidth amount for a stream of the entity for a current
8 superframe;

9 ascertaining an unserved bandwidth amount of the stream of the
10 entity from a previous superframe; and

11 determining an allocated bandwidth amount for the stream of the
12 entity based on the unserved bandwidth amount and responsive to the
13 bandwidth allocation request.

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15 **15.** The device as recited in claim 14, wherein the device further
16 comprises:

17 a transceiver that is adapted to transmit and receive wireless
18 communications and is capable of facilitating the action of receiving from an
19 entity a bandwidth allocation request.

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21 **16.** The device as recited in claim 14, wherein the entity comprises at
22 least one of a user or another device.

1 17. The device as recited in claim 14, wherein the requested bandwidth
2 amount for the current superframe includes the unserved bandwidth amount
3 from the previous superframe without separately designating the unserved
4 bandwidth amount.

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6 18. The device as recited in claim 14, wherein the ascertaining action
7 comprises:

8 retrieving the unserved bandwidth amount from the one or
9 more media.

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11 19. The device as recited in claim 14, wherein the device is capable of
12 operating under an IEEE 802.15.3 standard in accordance with a time division
13 multiple access (TDMA) technology.

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15 20. The device as recited in claim 14, wherein the processor-executable
16 instructions are adapted to direct the device to perform a further action
17 comprising:

18 segmenting the requested bandwidth amount into a newly-arrived
19 bandwidth amount of the stream of the entity and the unserved bandwidth
20 amount;

21 wherein the determining action comprises:

22 assigning a number of bandwidth units equaling the
23 unserved bandwidth amount prior to assigning any bandwidth units
24 to the newly-arrived bandwidth amount.

1 **21.** The device as recited in claim 20, wherein the processor-executable
2 instructions are adapted to direct the device to perform a further action
3 comprising:

4 assigning at least one bandwidth unit to an unserviced bandwidth
5 amount of another stream of another entity prior to assigning a bandwidth
6 unit to the newly-arrived bandwidth amount of the stream of the entity.

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8 **22.** The device as recited in claim 14, wherein the determining action
9 comprises:

10 assigning at least one bandwidth unit to the unserviced
11 bandwidth amount first;

12 assigning at least one bandwidth unit to a reserved bandwidth
13 amount of the stream of the entity second;

14 computing an overloaded bandwidth amount of the stream of
15 the entity by subtracting the unserviced bandwidth amount and the
16 reserved bandwidth amount from the requested bandwidth amount;
17 and

18 assigning at least one bandwidth unit to the overloaded
19 bandwidth amount third if any bandwidth units remain available.
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1 **23.** The device as recited in claim 14, wherein the processor-executable
2 instructions are adapted to direct the device to perform further actions comprising:

3 calculating the unserved bandwidth amount for the previous
4 superframe when determining an allocated bandwidth amount for the
5 stream of the entity for the previous superframe; and

6 retaining, from the previous superframe to the current superframe,
7 the unserved bandwidth amount using the one or more media for
8 utilization in the action of ascertaining.

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10 **24.** A method for bandwidth allocation, the method comprising:
11 receiving from multiple entities for multiple streams current bandwidth
12 allocation requests stipulating current requested bandwidth amounts for the
13 multiple streams of the multiple entities;

14 segmenting the current requested bandwidth amounts into current newly-
15 arrived bandwidth amounts and previous unserved bandwidth amounts
16 associated with the multiple streams of the multiple entities;

17 assigning bandwidth units to the previous unserved bandwidth amounts;

18 detecting if available bandwidth units have been consumed in the assigning;

19 and

20 if available bandwidth units have not been consumed in the
21 assigning, assigning the available bandwidth units to the current newly-
22 arrived bandwidth amounts according to current reserved bandwidth
23 amounts for the multiple streams of the multiple entities.

1 **25.** The method as recited in claim 24, further comprising:

2 if available bandwidth units have been consumed in the assigning,
3 calculating current unallocated bandwidth amounts for the multiple streams
4 of the multiple entities and noting the current unallocated bandwidth
5 amounts for subsequent use in segmenting subsequent requested bandwidth
6 amounts.

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8 **26.** The method as recited in claim 25, further comprising:

9 detecting if remaining available bandwidth units have been
10 consumed in the two assignments; and

11 if not, assigning the remaining available bandwidth units to
12 current overloaded bandwidth amounts of the multiple streams of the
13 multiple entities in ascending order.

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15 **27.** The method as recited in claim 24, further comprising:

16 updating previous reserved bandwidth amounts for the multiple streams of
17 the multiple entities to create the current reserved bandwidth amounts using at
18 least the current newly-arrived bandwidth amounts.

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20 **28.** The method as recited in claim 24, further comprising:

21 calculating current unserviced bandwidth amounts for the multiple streams
22 of the multiple entities by deducting assigned bandwidth units of one or more
23 assignments from the current requested bandwidth amounts.

1 **29.** The method as recited in claim 24, wherein the bandwidth units
2 comprise time units; and

3 further comprising:

4 combining assigned bandwidth units of one or more assignments into
5 allocated time slots for the multiple streams of the multiple entities; and

6 sending positions and durations of the allocated time slots for the multiple
7 streams to the multiple entities in at least one allocation broadcast.

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9 **30.** One or more processor-accessible media comprising processor-
10 executable instructions that, when executed, direct a device to perform the method
11 as recited in claim 24.

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13 **31.** An arrangement for bandwidth allocation, comprising:
14 ascertainment means for ascertaining respective previous unserved
15 bandwidth amounts associated with respective streams; and

16 determination means for determining respective current allocated
17 bandwidth amounts for the respective streams based on the ascertained respective
18 previous unserved bandwidth amounts.

1 **32.** The arrangement as recited in claim 31, further comprising:

2 transceiver means for transceiving wireless communications;

3 wherein the transceiver means comprises:

4 receiving means for receiving from respective entities respective
5 bandwidth allocation requests stipulating respective current requested
6 bandwidth amounts for the respective streams; and

7 transmission means for transmitting to the entities at least one
8 allocation broadcast including the determined respective current allocated
9 bandwidth amounts for the respective streams.

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11 **33.** The arrangement as recited in claim 32, wherein the determination
12 means further determines the respective current allocated bandwidth amounts for
13 the respective streams responsive to the respective bandwidth allocation requests
14 stipulating the respective current requested bandwidth amounts.

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16 **34.** The arrangement as recited in claim 31, further comprising:

17 segmentation means for segmenting respective current requested bandwidth
18 amounts into respective current newly-arrived bandwidth amounts and the
19 ascertained respective previous unserved bandwidth amounts;

20 wherein the determination means comprises:

21 assignment means for assigning bandwidth amounts to the
22 ascertained previous unserved bandwidth amounts prior to the current
23 newly-arrived bandwidth amounts.

1 **35.** The arrangement as recited in claim 34, wherein the assignment
2 means further assigns available bandwidth amounts to the current newly-arrived
3 bandwidth amounts prior to respective current overloaded bandwidth amounts of
4 the respective streams; and

5 wherein the determination means further comprises:

6 detection means for detecting if a time resource of assignable
7 bandwidth amounts is exhausted;

8 wherein the assignment means ceases assigning bandwidth amounts
9 if the time resource of assignable bandwidth amounts is detected as being
10 exhausted by the detection means.

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12 **36.** The arrangement as recited in claim 31, wherein the arrangement
13 comprises at least one of (i) one or more processor-accessible media and (ii) at
14 least one device.